

NEW NORTH AMERICAN RYGCHIUM (HYMENOPTERA, VESPIDAE).

By RICHARD M. BOHART, University of California, Davis, Calif.

A study of the collections of the California Academy of Sciences, Oregon Agricultural College, U. S. National Museum, Museum of Comparative Zoology at Harvard, and University of Kansas has revealed a new species and several unnamed subspecies of *Rygchium*. Holotypes have been deposited in the California Academy of Sciences.

***Rygchium macswaini*, n. sp.**

Male.—Black with the following yellow markings: mandible mostly, clypeus, scape in front, large triangular interantennal spot, lower ocular margin, long postocular spot, humeral margin, tegula, 2 pleural spots beneath, 2 spots on scutellum, stripe across postscutellum, large spot on propodeal angle, legs mostly (last tarsal segment light reddish), abdomen except for X-shaped black marks on tergites I and II, basal margin of sternite II and most of terminal segment. Wings moderately stained with reddish and brownish. Puncturation moderate, fine on clypeus and first two tergites except at apex of second where it is moderately coarse. Pubescence thick, golden brown, 2 to 3 ocellus diameters below ocelli, about 1 ocellus diameter on summit and horizontal face of tergite I, about $\frac{1}{2}$ ocellus diameter on remainder of tergites. Clypeus somewhat broader than long, apex distinctly produced and shallowly concave. Last antennal segment brownish, somewhat curved, flattened, twisted, reaching base of segment X. Humeral angle slightly obtuse, postscutellum serrately crested. Propodeal angles rather blunt, the hind face weakly margined, hardly punctured and with fine indistinct striae. Middle tibia not depressed at base. Abdomen stout, second segment about twice as broad as long. Length to apex of second tergite 7.5 mm.

Female.—Clypeus with a black spot, sometimes elongate, a pair of longitudinal yellow stripes on mesonotum. Clypeus somewhat narrowed and produced apically but not quite so decidedly as in male. Vertex depression almost as broad as ocellar area. Length to apex of second tergite 10.0 mm.

Holotype, male, Mt. Diablo, Contra Costa Co., California, May 19, 1939 (J. W. MacSwain).

6. Sternite II with free or attached yellow spots, tergite II usually with triangular attached spots, wings reddish brown (California) *blandinum* (Roh.)
 Sternite and tergite II without spots; wings brown (Eastern and central U. S.) *foraminatum* (Sauss.)
7. Tergite II moderately punctured and not upturned apically; legs mostly reddish and yellow, horizontal surface of tergite I all yellow in most females except for an angular transverse median spot; markings of notum deep yellow; female frons rather finely punctured (Texas) . . . *fedoris* R. Bohart
 Tergite II membranous and upturned apically, second and following tergites coarsely punctured toward apex; tergite I of female with a large black area on the horizontal surface; markings of notum (especially in female) tinged with reddish; female frons coarsely punctured (S. W. United States) *aequale* (Cameron)

Rygiium foraminatum oregonense, n. subsp.

Male.—Black and yellow, abdominal markings tending toward whitish. Pale markings as follows: clypeus, scape in front, mandible mostly, small interantennal spot, small postocular spot, narrow humeral margin, spots on tegula, narrow stripe across postscutellum, legs partly, apical margins of tergites I to V, sternite II (narrowly). Last tarsal segment of mid and hind tarsus dark brown. Wings stained with reddish brown. Tergite II not upturned or membranous apically, its subapical punctures small and well separated. Lateroapical margin of clypeus about 1.3 times as long as lateral margin. Length to apex of second tergite 9.0 mm.

Female.—Clypeus, scape, tergite V, sternite II except laterally, mandible and legs mostly, black. A small spot below tegula. Restricted basal markings on clypeus and a very small free spot on tergite II present in a few paratypes. Length to apex of second tergite 9.5 mm.

Holotype, male, Lick Creek Ranger Station (4600'), Wallowa National Forest, Oregon, August 16, 1937 (Bolinger-Jewett). Paratypes, 5 females, same data as type; 1 male and 3 females, Steens Mts. (7,000 ft.), Oregon (Bolinger-Jewett); 1 male and 2 females, Cornucopia, Oregon (Bolinger, Jewett and H. A. Scullen). Other paratypes from Grant Co., Klamath Lake, Suttle Lake, Wallowa Lake, Oregon; and Wawawai and near Stratford, Washington. I have also studied specimens agreeing in most respects

from Elko Co., Nevada; Jenny Lake, Wyoming; Kent Lake (near Beaver) and Salt Lake City, Utah; and Mono Lake, California.

This subspecies most closely resembles typical *foraminatum*, especially in the distribution of thoracic and abdominal markings. It differs, however in the paler yellow color, and particularly in the sparsely punctured and nonmembranous margin of tergite II. The generally finer puncturation, and usually black female clypeus and scape are added points of difference; also the clypeus of *oregonense* averages slightly longer in both sexes.

Rygchium foraminatum parvirudis, n. subsp.

Male.—Black with light yellow markings as follows: mandible mostly, clypeus, scape in front, interantennal spot, postocular dot, narrow humeral margin, scape partly, postscutellar stripe, apical margins of abdominal tergites I to VI (becoming progressively narrower), narrow margins of sternites II and III, lateral spots on following sternites, legs partly. Last segment of mid and hind tarsi dark brown. Wings dark brown with purplish reflections. Clypeus well punctured, lateroapical and lateral margins about equal in length. Abdominal tergite II rather finely punctured toward apex and without a membranous margin. Length to apex of second tergite 8.0 mm.

Female.—Clypeus black with small laterobasal spots, mandible black, scape almost all black, 2 spots of humeral margin very narrow, apical band of second tergite nearly obsolete, following tergites and all sternites black. Tegula entirely and legs mostly (entirely in 1 paratype) black. Length to apex of second tergite 11.0 mm.

Holotype, male, Tallahassee, Florida, April 1, 1944 (R. and G. Bohart). Paratypes, 1 male, same data as holotype; 1 female, McClellanville, South Carolina, May 11, 1944 (H. K. Townes); 1 female, Orlando, Florida, March 1944 (R. and G. Bohart).

This subspecies represents the darkest phase of *foraminatum*. In wing color it resembles *apopkense* but *parvirudis* has no reddish markings. It is the only form I have seen with all dark mandibles and tegulae in the female.

KEY TO THE SUBSPECIES OF *RYGCHIUM FUSUM* (CRESSON).

1. Markings principally black and reddish (Florida and southern Georgia) *rubrivestis* R. Bohart
- Markings with considerable amounts of yellow 2

2. Pronotum above entirely red and yellow, the latter covering one-half to three-fourths of area; second sternite mostly yellow (Owens Valley of California) **sanneoestis** R. Bohart
 Pronotum not entirely red and yellow, or if so, with latter covering less than half of area, second sternite of females and most males with more black or red than yellow (most of U. S. and parts of Mexico) *fusum* (Cresson)

Typical *fusum* varies from almost entirely red and yellow (as in the type from Texas) to specimens with more black than red and yellow combined. As in the color forms of *dorsale* (Fabr.), there seems to be little geographical significance involved. However, Florida and California have distinctively marked subspecies which are described below.

Rygiium fusum rubrivestis, n. subsp.

Black and reddish, a small amount of yellow and deep yellow. Yellow markings occur in male only and are: mandible spot, clypeus, scape in front, interantennal spot, lower orbit (these are all reddish in female). Deep yellow to orange yellow markings are: narrow humeral margin, apical margins of tergites I to III. Reddish are: facial markings and scape of female, inner side of flagellum and last two segments of male antenna, postocular spot, most of pronotum above, tegula, spot beneath, scutellum, most of postscutellum, propodeal angles broadly, most of tergite I, lateral spot of tergite II, legs partly except for coxae. Wings stained with dark brown, violaceous. Length to apex of second tergite, male 10.5 mm., female 12.5 mm.

Holotype, male, Orlando, Florida, March 1944 (R. and G. Bohart). Paratypes, 4 males and 3 females from following Florida localities: Ft. Meade (J. Nottingham), Tallahassee (R. and G. Bohart), Ft. Lauderdale (M. Bates), Wildwood (R. H. Beamer), Winter Park, Orlando, Pensacola. One male paratype, Okefenokee Swamp, Georgia (R. H. Beamer). Paratypes were collected in March, June, July, August and October.

Rygiium fusum sanneoestis, n. subsp.

Black, marked with yellow and reddish. Yellow are: mandible partly, clypeus, lower orbit, large interantennal spot, scape in front, postocular spot, front half of pronotum (two-thirds in some paratypes), small spot beneath tegula, scutellum mostly, propodeal angles broadly, legs partly (mid femur about

one-third yellow, two-thirds orange), abdomen except for last segment and basomedial dark areas on tergites I and II and sternite II. Orange red are: Mandible partly, scape partly, base and inner side of flagellum in male, including all of last segment, tinges around most yellow areas of body, hind half (or one-third) of pronotum, narrow line across middle of postscutellum, legs partly, especially on femora, last abdominal segment. Wings moderately stained with reddish and brownish. Tergite II with apical reflexed edge about 2.5 times an ocellus diameter. Length to apex of tergite II, male 10.5 mm., female 12.5 mm.

Holotype, male, Lone Pine, Inyo Co., California, June 18, 1937 (E. C. Van Dyke). Paratypes, 1 male and 8 females, Lone Pine and Big Pine, Inyo Co., California, June (E. C. Van Dyke, E. P. Van Duzee, R. Bohart).

This subspecies is homeochromic with *R. boscii auranum* (Cameron) which occurs in the same area.

KEY TO THE SUBSPECIES OF *RYGCHIUM TEMPIFERUM* (VIERECK).

1. Light markings mainly orange or orange and yellow, flagellum reddish, at least at base 2
 Light markings mainly yellow 3
2. With some black markings (S. Colorado and New Mexico).
 tempiferum (Viereck)
 Without black markings (Oklahoma) . . *pritchardi* (Bequaert)
3. Yellow markings strongly tinged with reddish, especially on tergite I, flagellum entirely black (Utah)
 subrubeum R. Bohart
 Yellow markings not or only slightly tinged with reddish . . . 4
4. Apical margin of tergite II reflexed less than one ocellus diameter, margin of III not swollen (Northwestern U. S.)
 eldoradense (Rohwer)
 Apical margin of tergite II reflexed more than one ocellus diameter, margin of III swollen a little less than one ocellus diameter (Charleston Mts., Nevada)
 birepandum R. Bohart

Rygchium tempiferum subrubeum, n. subsp.

Male.—Pattern black, yellow and some reddish. Yellow are: mandible mostly, clypeus, scape in front, lower orbit, interantennal spot, legs partly, apical margin of tergite I, segments II to VI except for V-shaped basal black spot on sternite II

and broad X-shaped black spot at base of tergite II. Reddish are: mandible at tip, scape behind, postocular spot, pronotum above mostly, tegula, spot beneath, 2 small scutellar spots, spots on propodeal angles, legs partly (femora black, red and yellow), large lateral spots on horizontal surface of tergite I (smaller in some paratypes). Wings moderately stained with reddish and brownish, slightly violaceous. Pubescence at summit of tergite I as long as 3 to 4 ocellus diameters. Tergite II with apical margin reflexed slightly less than 1 ocellus diameter. Length to apex of second tergite 11.2 mm.

Holotype, male, Beaver Canyon, Utah (6500 ft.), June 11, 1946 (R. Bohart). Paratypes, 5 males, same locality and collector as type. I have seen a female referable to this subspecies from Creede, Colorado (8844 ft.), August, 1914 (S. J. Hunter). It has the dorsum of the thorax black save for a narrow orange humeral margin and it has a 3-pronged black clypeal mark.

Rygiium tempiferum birepandum, n. subsp.

Male.—Black and yellow, legs slightly tinged with red. Yellow are: mandible mostly, clypeus, lower orbit, scape in front, interantennal spot, postocular spot, broad humeral margin, tegula mostly, coxae and femora partly, tibiae and tarsi, broad apical margins of all abdominal segments except sternite I, that on tergite I enlarged laterally to partly enclose a black horizontal area. Tergite I with pubescence at summit as long as 3 to 4 ocellus diameters. Tergite II with apical margin reflexed about 1.5 ocellus diameters, tergite III reflexed about half as much. Length to apex of second tergite 11.0 mm.

Holotype, male, and 5 male paratypes, Charleston Mountain Park, Nevada (9,000 ft.), June 21, 1940 (R. Bohart).

Rygiium alvarado safranum, n. subsp.

Black, marked with yellow and reddish yellow. Yellow are: spot on mandible, clypeus, scape in front, lower orbit, a semi-circular frontal spot, legs partly (including coxae in front). Orange or reddish yellow are: mandible and basal three antennal segments partly, postocular spot, humeral and posterior margins of pronotum above tegula, spot beneath, a lateral spot on scutellum, band across postscutellum, propodeal spots, legs mostly, broad apical margins of all tergites, those on I and II with large attached spots, broad apical margins of second and following sternites, that on II covering 2/3 of segment. Wings

lightly stained with orange and brownish. Last two antennal segments of male reddish brown. Length to apex of second tergite, male 10.5 mm., female 11.5 mm.

Holotype, male, Alpine, Texas, June 30, 1942 (E. C. Van Dyke). Paratypes, 1 male, Valentine, Texas, July 13, 1927 (P. A. Readio); 1 male, Davis Mts., Texas, July 10, 1942 (E. C. Van Dyke); 1 male, Davis Mts., Texas, June 28, 1942 (H. A. Scullen); 1 female, Chisos Mts., Texas, June 10-12, 1908 (Mitchell and Cushman).

Rygchium alvarado (Sauss.) has the size and shape of *R. annulatum* (Say) but differs in having interocellar tubercules and both front and hind margins of the pronotum yellow. It occurs in Mexico, Arizona, and New Mexico. In western Texas it occurs as subspecies *safranum* which instead of being essentially black and deep ivory yellow is marked with orange and reddish yellow.

BOOK NOTES.

Catalogue of the North American Beetles of the Family Cleridae, by Albert R. Wolcott. *Fieldiana: Zoology*, vol. 32, no. 2, pp. 61-104. Chicago Natural History Museum, Chicago, Illinois.

The author in the opening paragraph of his introduction, states precisely the purpose of this catalogue in these words: "In order that certain necessary changes in nomenclature and systematics may be made known to those interested in the North American Cleridae, the present revision of existing catalogues is offered." This statement is followed by a brief history of the classification of the family. A number of changes in nomenclature have been made to bring the generic and other names in line with the provisions of the International Code. An extensive bibliography closes the paper, which in addition has a general index of species, genera and higher groups, naturally including synonymy.

Mr. Wolcott says nothing of the tedious, exacting labor of putting together such a mass of accurate data; but this reviewer emphasizes this aspect, an aspect to be remembered by those leisurely critics, who look at the fly perched on a work of art, and not at the beauty of the whole.

J. R. T.-B.